

A REVISION OF THE GENUS *OBRIMA* WALKER (LEPIDOPTERA:
NOCTUIDAE), WITH A DESCRIPTION OF A NEW SPECIES
FROM COSTA RICA AND NOTES ON ITS NATURAL HISTORY

MICHAEL G. POGUE AND DANIEL H. JANZEN

(MGP) Systematic Entomology Laboratory, PSI, Agricultural Research Service, U.S. Department of Agriculture, c/o National Museum of Natural History, MRC-168, Washington, DC 20560, U.S.A. (e-mail: mpogue@sel.barc.usda.gov); (DHJ) Department of Biology, University of Pennsylvania, Philadelphia, PA 19104, U.S.A. (e-mail: djanzen@sas.upenn.edu).

Abstract.—The genus *Obrima* Walker contains three species of essentially Neotropical distribution: *Obrima pyraloides* Walker, distributed from Mexico to Paraguay; *Obrima rinconada* Schaus from Guatemala and Mexico, to southwestern United States in Arizona and southwestern Texas; and *Obrima cymbae* Pogue, n. sp., known only from Costa Rica. *Obrima pyraloides* was reared on *Lonchocarpus minimiflorus* Donn., *Lonchocarpus phlebophyllus* Standley and Steyerl., and *Lonchocarpus orotinus* Pittier (Fabaceae), while *Obrima cymbae* was reared on *Lonchocarpus orotinus*.

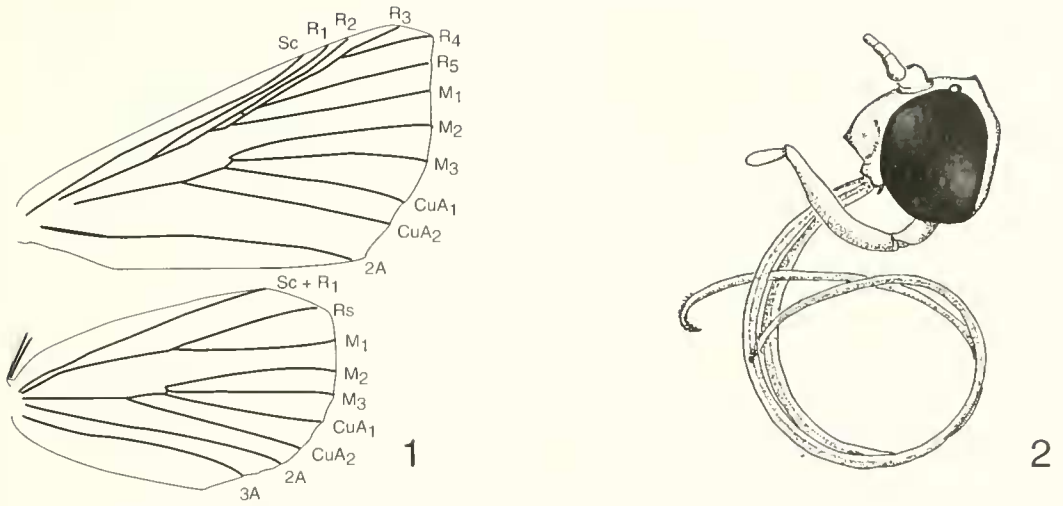
Key Words: *Obrima cymbae*, *Obrima pyraloides*, *Obrima rinconada*, Ophiderinae, *Lonchocarpus*, tropical dry forest, Area de Conservación Guanacaste

The genus *Obrima* Walker is currently placed in the Catocalinae (Kitching and Rawlins 1998). The Catocalinae are "quadrid" noctuids based on the presence of a strong vein M_2 of the hindwing (Fig. 1). Included in the Catocalinae are the Ophiderinae, except those genera that have specialized apical armature on the proboscis modified to pierce thick-skinned fruit or mammalian skin which are placed in the Calpinae (Kitching and Rawlins 1998). The basis for separating these two subfamilies was of the presence of spines on the mesothoracic tibia, an entirely unreliable character that should not be used (Kitching 1984). *Obrima* was originally described by Walker (1856) to include *Obrima pyraloides*. Schaus (1894) later described *Obrima rinconada* from Mexico.

Obrima cymbae, n.sp., and its host plant, *Lonchocarpus orotinus*, are endemic to

Guanacaste Province, Costa Rica. *Obrima pyraloides* also feeds on this endemic species, as well as on two other *Lonchocarpus*. The host range of *Obrima pyraloides* is probably broader than is recorded because the Costa Rican hosts do not occur over the rest of its range (Fig. 21). Nothing is known about the host(s) of *Obrima rinconada*, but by looking at the distribution of *Lonchocarpus* one can make inferences. The distribution of *Obrima rinconada* extends from southern Arizona and Texas to western Guatemala (Fig. 21). *Lonchocarpus* does not occur in the southern United States so another host, possibly in the same family, is likely.

Obrima occurs from the southwestern United States south through Mexico, Dominica, Central America, Venezuela, Bolivia, and Paraguay. In the northern hemisphere, the flight period of *Obrima* is during the



Figs. 1, 2. *Obrima pyraloides*. 1, Wing venation. 2, Head.

first half of the rainy season, from late April through August. Host plants and other aspects of the natural histories of *Obrima pyraloides* and *Obrima cymbae* are described below. A total of 99 specimens were examined from the National Museum of Natural History, Smithsonian Institution, Washington, D.C. (USNM), Instituto Nacional de Biodiversidad, Santo Domingo de Heredia, Costa Rica (INBio), and Eric H. Metzler collection (EHM) for this study.

Obrima Walker

Obrima Walker, 1856: 134.—Nye, 1975: 343.—Poole, 1989: 708.—Poole and Gentili, 1996: 759.

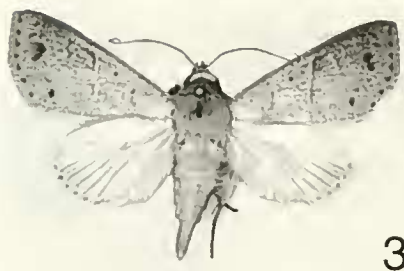
Type species: *Obrima pyraloides* Walker, 1856, by monotypy.

Diagnosis.—*Obrima* can be distinguished from the similarly appearing genera *Ensipia* Walker, *Juncaria* Walker, and cream-colored species of *Herminodes* Guenée by the conical-shaped unscaled frons and large signum in the female genitalia that has a bifurcate apex and a central groove formed by the lateral margins curving toward the center line (Fig. 18–20).

Description.—*Adult* (Figs. 1–20). Forewing length 13.5–21.5 mm.

Head: Vestiture smooth. Frons bare,

modified into a conical projection. Eye well developed. Ocellus present. Antenna filiform, scaled dorsally, setose ventrally. Labial palpus porrect, apical segment forms close to a right angle with second segment. Maxillary palpus 2-segmented. *Thorax*: Vestiture smooth. Prothoracic tibia dorsally with tuft of elongate hairs, epiphysis large extending to apex of prothoracic tibia, with a dense scale brush beneath. Legs lacking spines. Mesothoracic tibia dorsally concave to retain a hair pencil from base; dense dorsal brush of hair-like scales present from apex of first tarsomere to base of third tarsomere; apical spurs short, longest not reaching apex of first tarsomere, shortest spur $0.75 \times$ length of longest. Metathoracic tibial base ventrally with patch of stiff hair-like scales; 2 pairs of apical spurs, basal pair with shortest spur more than $0.5 \times$ length of longest, distal pair with shortest spur less than $0.5 \times$ length of longest. *Forewing*: Male length 13.5–21 mm, female length 14.5–21.5 mm. Accessory cell present. R_2 , R_{3+4} , and R_5 connate. Outer margin forming obtuse angle at vein M_3 . *Hindwing*: Vein M_2 present, CuA appearing 4-branched. *Male genitalia*: Uncus curved, setose, apical spine decurved. Valve narrow, clasper present. Vesica with 3 or 4 di-



3



4



5



6



7



8

Figs. 3–8. Adults of *Obrima*. 3, *O. pyraloides*, ♂. 4, *O. rinconada*, ♂, holotype. 5, *O. rinconada*, ♀. 6, *O. rinconada*, ♀. 7, *O. cymbae*, ♂. 8, *O. cymbae*, ♂.

verticula. Two cornuti, elongate, contained within first diverticula. *Female genitalia*: Ductus bursa simple, rectangular, divided by membrane. Corpus bursa with striate convolutions. Signum elongate, apex bifurcate into pointed and truncate projections, central groove formed by lateral margins curving toward center line.

Obrima pyraloides Walker
(Figs. 1–3, 9, 10, 18, 21)

Obrima pyraloides Walker, 1856:135.—
Nye, 1975: 343.—Poole, 1989: 708.

Diagnosis.—*Obrima pyraloides* is a medium sized moth with forewing ground col-

or cream, median line straight, postmedial line with black spots in cells M_1 and CuA_2 , and termen curved at vein M_3 as compared to angulate in *Obrima rinconada*. The female is more brown than the paler male.

Description.—*Adult Male*. *Head*: Labial palpus rufous, apical segment cream. Frons with scales adjacent to eye rufous, remainder cream; vertex cream. Antennal scape cream; flagellar scales cream. *Thorax*: Dorsum cream. Underside with scale collar adjacent to eye rufous from just above forewing to labial palpus, sternum pale rufous, remainder white. Prothoracic tibia rufous and cream; tarsus rufous. Mesothoracic tibia cream mixed with rufous; tarsus buff.

Metathoracic tibia cream with a few rufous scales; tarsus cream becoming pale gray distally. *Forewing* (Figs. 1, 3): Length 17–18 mm; ground color cream to pale brown; antemedial line indistinct, cream bordered by pale gray proximately; orbicular spot small, black; median line cream bordered by pale gray distally, straight; costal patch distal to median line absent; postmedial line with distinct black spots, largest in cells M_1 and CuA_2 ; black spots along outer margin; termen curved at vein M_3 ; fringe cream; underside ground color cream. *Hindwing* (Fig. 3): Ground color cream. *Abdomen*: Cream. *Genitalia* (Figs. 9, 10): Uncus curved dorsad, setose, equal width throughout length (in lateral view), apical spine decurved. Valve with parallel sides, distal 0.25 curved dorsad, apex round. Clasper wide. Vesica with 4 diverticula, 1 shortest, 2 elongate and above 3 and 4.

Adult female.—Similar to male except forewing length 15.5–18.0 mm and ground color pale brown. *Genitalia* (Fig. 18): Postvaginal plate wider than long. Ductus bursa with length less than $2 \times$ width. Corpus bursa elongate, juncture with ductus bursa gradual. Signum straight; less than $0.25 \times$ length, extends into ductus bursa, apex truncate.

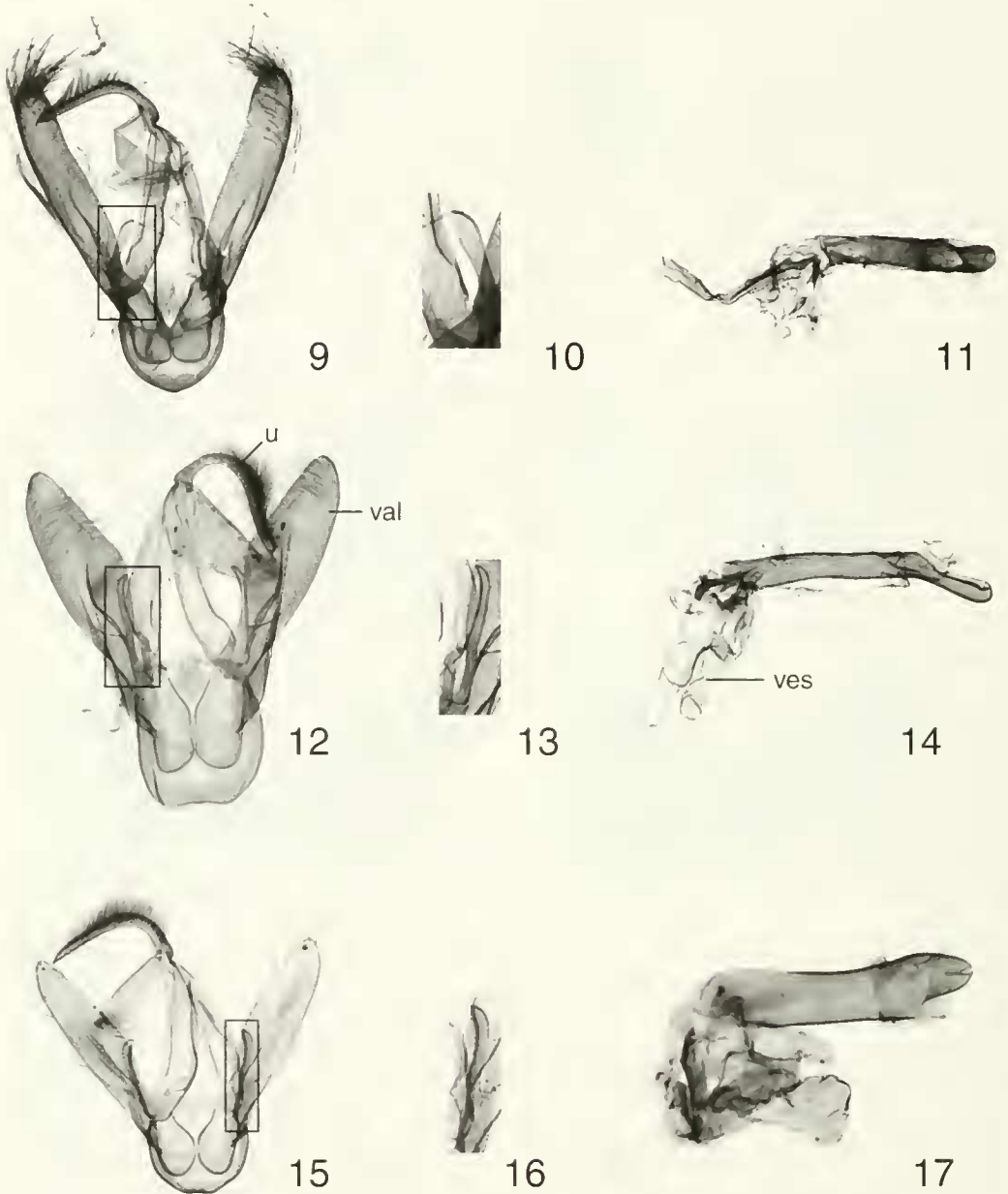
Type material.—Holotype ♂, in The Natural History Museum, London. Type locality is Honduras.

Immature stages.—In the lowland dry forests of the Area de Conservación Guanacaste (ACG), northwestern Costa Rica (Janzen 1988a, b, 1993), the larvae feed on the new and maturing leaves of *Lonchocarpus minimiflorus*, *Lonchocarpus phlebophyllus*, and *Lonchocarpus orotinus* (Fabaceae) during the first 30 days of the rainy season, usually in May (Janzen and Hallwachs 1997). The relatively naked last instar larva is gray with yellow-cream dots, has several large black spots on the ventral side, and has a gray head with fine black lines. The very tough-walled rust-colored cocoon is spun in the litter during the first 1–3 weeks of the rainy season, and eclosion

occurs (in captivity) three weeks to two months later (Janzen and Hallwachs 1997). Adults of this apparently univoltine tropical dry forest species first appear in the thousands (DHJ, unpublished data) at lights about a week before the rainy season begins, the same time the *Lonchocarpus* host plants are beginning leaf bud break, and then occur rarely throughout the first half of the rainy season. *Obrima pyraloides* adults persist in the habitat as nonreproductive individuals during the second half of the rainy season and all of the dry season. This reproductive pattern is commonplace for moths in the ACG dry forest (Janzen 1987).

Distribution (Fig. 21).—Recorded from lowland tropical dry forests in Mexico, Costa Rica, Panama, Venezuela, Paraguay, and Dominica.

Material examined.—46 ♂ and 16 ♀. BOLIVIA: Mutum, 20 miles W. of Porto Suarez, 1500 ft., 7–14 Nov. 1927, at light, C.L. Collenette, 1 ♀. COSTA RICA: Guanacaste Prov.: Colorado, 31 March 1988, W.E. Steiner, J.M. Hill, J.M. Swearingen, J.M. Mitchell, 1 ♂; Candelaria Mts., Underwood, 1 ♂; San Jose, H. Schimdt, 1 ♂, 1 ♀, 23 May 1922, H. Schimdt, 1 ♀. DOMINICA: Grand Savane, 7 June 1964, O.S. Flint, Jr., 1 ♂, (green label, genitalia slide, USNM 44078), 1 ♀; July 1905, E.A. Agar, 1 ♂. GRENADA: 20–29 Apr. 1968, C. de Worms, 1 ♀. JAMAICA: sea level, Mar. 1968, G. Newman, 1 ♂; N. Coast, S. level, Mar. 1961, G. Newman, 1 ♂; Oracabessa, sea level, Mar.–Apr. 1962, G. Newman, 1 ♂. MEXICO: Sinaloa: Venadio, Collection Wm. Schaus, 3 ♂ (white label, genitalia slide: USNM 435, J.G. Franclemont), 1 ♀ (white label, genitalia slide: USNM 436, J.G. Franclemont); Nuevo Leon: Rinconada, Collection Wm. Schaus, 2 ♂, 2 ♀, Dognin Collection, 1 ♂; Veracruz: Orizaba, Dognin Collection, 1 ♂. PANAMA: Barro Colorado Is., 1–9 May 1964, W.D. & S.S. Duckworth, 1 ♂. PARAGUAY: [No specific locality], Pouillon, Dognin Collection, 2 ♂. VENEZUELA: Guárico: Hato Masa-



Figs. 9–17. Male genitalia. 9, *Obrima pyraloides*, genitalia. 10, *O. pyraloides*, clasper. 11, *O. pyraloides*, aedeagus. 12, *O. rinconada*, genitalia. 13, *O. rinconada*, clasper. 14, *O. rinconada*, aedeagus. 15, *O. cymbae*, genitalia. 16, *O. cymbae*, clasper. 17, *O. cymbae*, aedeagus. Abbreviations: u, uncus; val, valve; ves, vesica.

gual, 45 km S Calabozo, 8.° 57['] N 67.° 58['] W, Gal[le]ry Forest #4, 75 m[eters], 13 Apr. 1988, M. Epstein & R. Blahnik, 2 ♂, Gal[le]ry Forest #5, 15–17 Apr. 1988. 1 ♀ (green label, genitalia slide, USNM 44072), Gal[le]ry Forest #6, 17 Apr. 1988,

1 ♂, Gal[le]ry Forest #7, 19–21 Apr. 1988, 1 ♂ (green label, genitalia slide, USNM 44080), Gal[le]ry Forest #8, 19–21 Apr. 1988, 1 ♂ (green label, genitalia slide, USNM 44079), Gal[le]ry Forest #9, 10 ♂ (green labels, genitalia slides, USNM

44073, 44081), Gal[le]ry Forest #10, 23–24 Apr. 1988, 4 ♂ (green label, genitalia slide, USNM 44071), Gal[le]ry Forest #16, 6–8 May 1988, Gal[le]ry Forest #20, 13–16 May 1988, 9 ♂, 3 ♀, Gal[le]ry Forest #23, 21 May 1988, 1 ♀, Gal[le]ry Forest #24, 25 May 1988, 1 ♂, 1 ♀, Gal[le]ry Forest #28, 3–5 June 1988, 1 ♂, 1 ♀.

Discussion.—There is some sexual dimorphism with the female having more speckling of brown and black scales across the forewing giving an overall darker appearance. This speckling also occurs in the male, but is less marked. The hindwing in both sexes can have a variable amount of dark scaling along the outer margin. The greatest variation occurs in Venezuela.

Obrima rinconada Schaus
(Figs. 4–6, 12–14, 19, 21)

Obrima rinconada Schaus, 1894: 240.—
Poole, 1989: 708.

Obrima pimaensis Barnes and Benjamin,
1925a: 126.—Poole, 1989: 708 [jr. syn.
of *rinconada*].

Obrima rinconada primaensis Barnes and
Benjamin, 1925b: 168, [incorrect subse-
quent spelling of *pimaensis*].

Diagnosis.—*Obrima rinconada* is a medium sized moth with cream to pale brown ground color suffused with brown scales giving a speckled appearance. The forewing has the median line curved and variably outlined in brown, postmedial line with black spots in cells M_{1-2} , and termen more sharply angulate at vein M_3 than in the other two species of *Obrima*. The female is more speckled and the postmedial spots are less distinct than in the male.

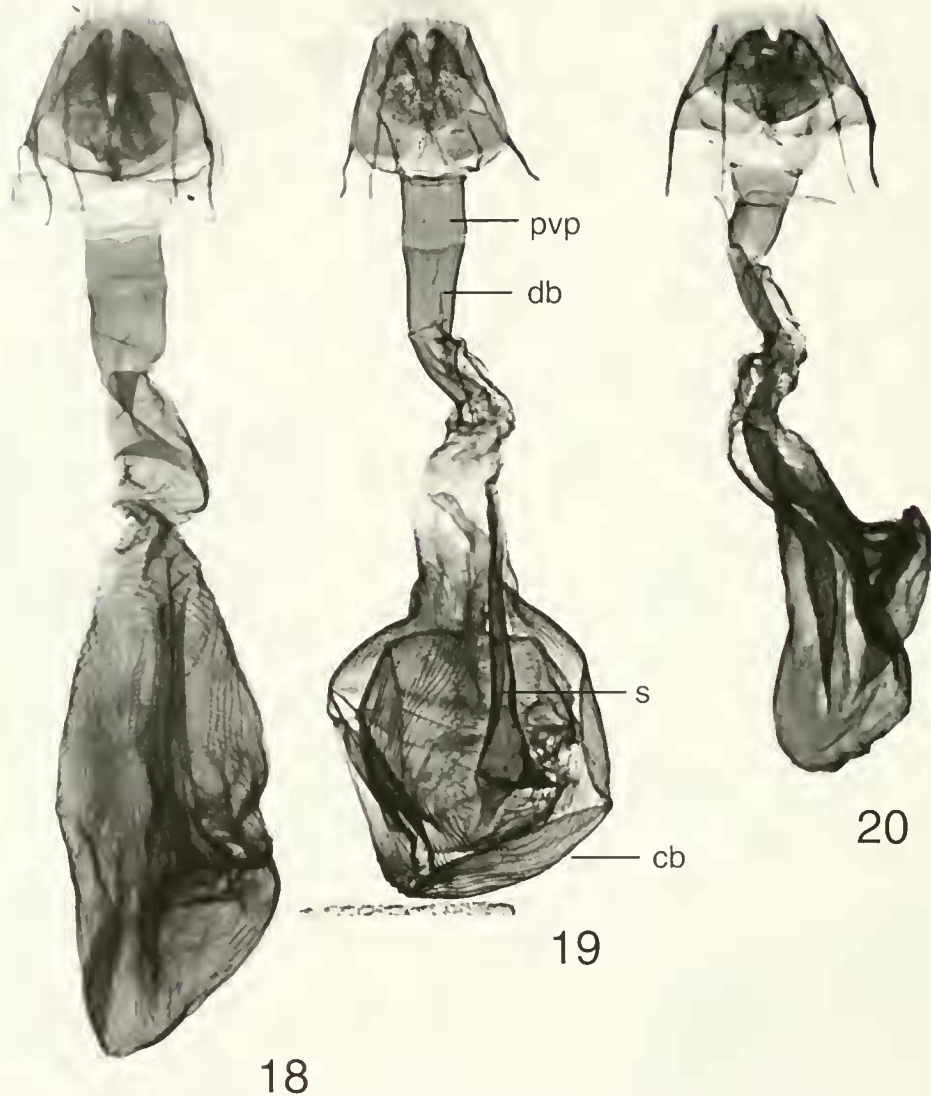
Description.—*Adult Male*. *Head*: Labial palpus rufous, apical segment cream. Frons with scales adjacent to eye rufous, remainder cream; vertex cream. Antennal scape cream; flagellar scales cream. *Thorax*: Dorsum cream mixed with brown. Underside with scale collar adjacent to eye rufous from just above forewing to labial palpus, sternum rufous, remainder white. Protho-

racic tibia rufous and cream; tarsus rufous. Mesothoracic tibia cream mixed with rufous; tarsus buff. Metathoracic tibia cream with a few rufous scales; tarsus cream becoming pale gray distally. *Forewing* (Figs. 4–6): Length 18–21 mm; ground color cream to pale brown; antemedial line indistinct, gray; orbicular spot small, black; median line cream bordered by pale gray distally, curved from R vein to inner margin; costal patch distal to median line pale brown, indistinct; postmedial line with largest black spots in cells M_{1-2} , spots surrounded by brown scales, thus almost appearing as a band; black spots along outer margin; termen sharply angled at vein M_3 ; fringe cream; underside ground color cream. *Hindwing* (Figs. 4–6): Ground color buff. *Abdomen*: Buff. *Genitalia* (Figs. 12–14): Uncus curved dorsad, setose, wider at middle than at base and apex (in lateral view), decurved apical spine. Valve with dorsal margin bowed in middle, apex round. Clasper narrow. Vesica with 3 diverticula: first divided, second and third elongate, third recurved.

Adult female.—Essentially as described for male except, Forewing length 19–21.5 mm; ground color pale brown to gray; black spots along outer margin faint to absent in some specimens. Postmedial line with indistinct black spots in cells M_{1-2} . *Genitalia* (Fig. 19): Postvaginal plate longer than wide. Ductus bursa sclerotized, with length more than $2 \times$ width. Corpus bursa round, juncture with ductus bursa distinct. Signum straight; more than $0.5 \times$ length extends into ductus bursa, apex a truncate.

Type material.—Holotype, ♂, in the USNM with following 4 labels: 1) Rinconada, V. Cruz, 2) Collection Wm. Schaus, 3) Type No. 10492 U.S.N.M (red label), 4) *Obrima Rinconada* type. Schs. (hand written).

Obrima pimaensis was described from a male holotype and 4 male paratypes, all in the USNM. The holotype has the following 2 labels: 1) Baboquivari Mts., Pima Co., Ariz., El. approx. 5000 ft., 15–30 June



Figs. 18–20. Female genitalia. 18, *Obrima pyraloides*. 19, *O. rinconada*. 20, *O. cymbae*. Abbreviations: pvp, postvaginal plate; db, ductus bursae; s, sterigma; cb, corpus bursae.

1923. O.C. Poling, Coll., 2) *Obrima pimaensis*, Holotype ♂ B. & Benj. (label bordered with red and red lines, hand written). The 4 paratypes have the same labels as holotype, except the second label says "Paratype" instead of "Holotype".

Immature stages.—Unknown.

Distribution (Fig. 21).—Recorded from Mexico, Guatemala, and the United States

from southern Arizona and southwestern Texas.

Material examined.—18 ♂ and 6 ♀. GUATEMALA: San Marcos: 17.3 km SE Talisman, Rio Cabuz at Hwy. CA2, 14°51'N, 092°04'W, 200 mts., 23 May 1973, Erwin & Hevel, Central American Expedition, 1973, 1 ♂. MEXICO: Nuevo Leon, Rinconada, Collection Wm. Schaus.



Fig. 21. Distribution of *Obrima*. Solid squares *O. rmcnada*; circles *O. pyraloides*; shaded-square *O. cymbae*.

5 ♂ (green labels, genitalia slides, USNM 44074, 44075, 44083), (white label, genitalia slide: USNM 433, J.G. Franclemont), 3 ♀ (green label, genitalia slide, USNM 44084), (white label, genitalia slide: USNM 434, J.G. Franclemont), Dognin Collection, 2 ♂; Sinaloa: Venadio, Collection Wm. Schaus, 1 ♂ (green label, genitalia slide, USNM 44082). Oaxaca: 36.3 km N. Oaxaca, Hwy. 190, 1981 mts., 21 May 1973, Erwin & Hevel, Central American Expedition, 1973, 1 ♀. ARIZONA: So. Arizona, July 15–30, 1 ♂; Cochise Co., Huachuca Mts., Ash Canyon Rd. (½ mi W. Hwy. 92, Lot 4; 5100 ft. el.), N. McFarland, *Hab.* 1s OAK-manzanita + grassland, at uv. light, L 6–82, 1 ♀, M 8–83, 1 ♂, 26 Jun. 81, 1 ♀.

Pima Co., Baboquivari Mts., El. Approx. 5000 ft., 15–30 June 1923, O.C. Poling, Coll., 4 ♂. Santa Cruz Co., Madera Canyon, 5100', Santa Rita Mts., July 10–26, 1964, D.R. Davis, 1 ♂; T20S. R14E. Sec. 2, Madera Canyon, Santa Rita Lodge, el. 4840', 5 July 1987, Eric H. Metzler 1 ♂ (EHM). TEXAS: Brewster Co., Big Bend Nat'l. Pk., Green Gulch, 5400', 2–4 VI 86, leg. E.C. Knutson, 1 ♂.

Discussion.—This species shows stronger sexual dimorphism than does *Obrima pyraloides*, with the female more speckled than the male, resulting in a more brown to gray forewing ground color. The spotting along the postmedial line is also indistinct to absent in the female. The shape of the

median line is straight in *Obrima pyraloides* and forms an obtuse angle below the discal cell in *Obrima rinconada*.

***Obrima cymbae* Pogue, new species**

(Figs. 7, 8, 15–17, 20, 21)

Diagnosis.—This is the smallest species of *Obrima* and has the forewing ground color a dark-reddish brown and termen not as angulate at vein M_3 as in *Obrima rinconada*.

Description.—*Adult Male. Head:* Labial palpus dark reddish brown, apical segment mixed with a few cream scales. Frons with scales adjacent to eye dark reddish brown, remainder dark reddish brown tipped with white; vertex dark reddish brown tipped with white. Antennal scape cream with a few rufous scales; flagellum scales cream. *Thorax:* Dorsum dark reddish brown tipped with white. Underside with scale collar adjacent to eye dark reddish brown from just above forewing to labial palpus, sternum paler, remainder white. Prothoracic tibia dark brown with some scales tipped white; tarsus dark brown. Mesothoracic tibia dark reddish brown tipped with white; tarsus grayish-brown. Metathoracic tibia rufous mixed with cream; tarsus grayish brown. *Forewing* (Figs. 7, 8): Length 13.5–15 mm; ground color reddish brown to dark reddish brown; antemedial line indistinct, gray; orbicular spot minute, consisting of only a few scales, dark brown; median line gray bordered by cream scales proximally; costal patch distal to median line dark brown; postmedial line indistinct, cream, bordered by gray distally, sinuous; black spots along outer margin (can be indistinct or absent); fringe rufous; underside ground color cream. *Hindwing* (Figs. 7, 8): Ground color rufous. *Abdomen:* Rufous. *Genitalia* (Figs. 15–17): Uncus curved dorsad, setose, equal width throughout length (in lateral view), decurved apical spine. Valve with dorsal margin bowed in middle, apex narrowed. Clasper wide. Vesica with 4 diverticula, first shortest, second bulbous and lateral to third and fourth.

Adult female.—Similar to male except forewing 14.5–16.0 mm. *Genitalia* (Fig. 20): Postvaginal plate wider than long. Ductus bursa with length less than $2 \times$ width. Corpus bursa elongate, juncture with ductus bursa gradual. Signum sinuous; less than $0.25 \times$ length extends into ductus bursa, apex truncate.

Type material.—Holotype, ♂, in INBio with following label: "Voucher-INBio data base-Costa Rica, 96-SRNP-2011, Testigo-base de datos INBio-Costa Rica". Type locality is Costa Rica, Provincia Guanacaste, Area de Conservación Guanacaste, Sector Santa Rosa, Area Administrativa, 280 m, LN 313400 LE 358900, May 12, 1996, wild-caught adult, D. H. Janzen and W. Hallwachs. Paratypes: 4 ♂, 6 ♀. Deposited in the USNM; American Museum of Natural History, New York, New York; Canadian National Collection, Ottawa, Canada; and The Natural History Museum (British Museum), London, England. COSTA RICA: Provincia Guanacaste, Area de Conservación Guanacaste, Sector Santa Rosa, Area Administrativa, 280 m, LN 313400 LE 358900, D. H. Janzen and W. Hallwachs: wild caught adults at light: 1 ♂, 9 May 1996, 96-SRNP 2006; 3 ♀, 12 May 1996, 96-SRNP-2008, 96-SRNP-2009, 96-SRNP-2010. Ojochal, 10 m, LN 308550 LE 355200, D. H. Janzen and W. Hallwachs: reared adults eclosing from cocoons in captivity: 1 ♂, 12 Aug 1994, 94-SRNP-1675; 1 ♂, 7 Jul 1994, 94-SRNP-1670; 1 ♀, 28 Jul 1994, 94-SRNP-1677; 1 ♂, 28 Jun 1994, 94-SRNP-1680. Vado Rio Nisperal, 10 m, LN 309450 LE 355300, D. H. Janzen and W. Hallwachs: reared adults eclosing from cocoons in captivity: 1 ♀, 17 Jun 1994, 94-SRNP-1704; 1 ♀, 20 Jul 1994, 94-SRNP-1707.

Immature stages.—In the lowland dry forests of the Area de Conservación Guanacaste (ACG), northwestern Costa Rica (Janzen 1988a, b, 1993), the larvae feed on the new and maturing leaves of *Lonchocarpus orotinus* (Fabaceae) during the first 30 days of the rainy season, usually in May

(Janzen and Hallwachs 1997). The relatively naked last instar larva is grayish green. The very tough-walled pink to rust-colored cocoon is spun in the litter during the first few weeks of the rainy season, and eclosion occurs (in captivity) 1–2 months later (Janzen and Hallwachs 1997). The reproductive biology of *Obrima cymbae* appears to be essentially identical to that of *Obrima pyr-aloides* except that the former is apparently restricted to a single species of *Lonchocarpus* as a larval food plant.

Distribution (Fig. 21).—Known only from Sector Santa Rosa, Area de Conservación Guanacaste, northwestern Costa Rica.

Discussion.—This species can be easily distinguished from the other two species of *Obrima* by its smaller size and reddish-brown forewing ground color.

Etymology.—In recognition of the contribution of Thom Gerst and Cymba Yanagita Gerst to the development of INBio (Instituto Nacional de Biodiversidad) in Costa Rica, *Obrima cymbae* is named in honor of Cymba Yanagita Gerst.

ACKNOWLEDGMENTS

We thank E. H. Metzler, S. H. McKamey of the Systematic Entomology Laboratory, Agricultural Research Service, U.S. Department of Agriculture, and I. J. Kitching of The Natural History Museum (London) for critically reviewing this manuscript. This research was supported by NSF grant DEB 9400829 and DEB 9705072 to DHJ, and by INBio and the Area de Conservación Guanacaste, Costa Rica. We appreciate the support of Winnie Hallwachs, who caught the first specimen of *Obrima cymbae*.

LITERATURE CITED

- Barnes, W. and F. H. Benjamin. 1925a. Notes and new species (Lepidoptera). Proceedings of the Entomological Society of Washington 27: 123–129.
- Barnes, W. and F. H. Benjamin. 1925b. Notes on the genus *Obrima* Walker in the U.S. (Lepidoptera: Phalaenidae; Erebinidae). Proceedings of the Entomological Society of Washington 27: 168.
- Janzen, D. H. 1987. How moths pass the dry season in a Costa Rican dry forest. Insect Science and its Application 8: 489–500.
- . 1988a. Ecological characterization of a Costa Rican dry forest caterpillar fauna. Biotropica 20: 120–135.
- . 1988b. Guanacaste National Park. Tropical ecological and biocultural restoration. In Cairns, J. J., ed., Rehabilitating Damaged Ecosystems, Vol. II, CRC Press, Boca Raton, Florida, pp. 143–192.
- . 1993. Caterpillar seasonality in a Costa Rican dry forest. In Stamp, N. E. and T. M. Casey, eds. Caterpillars. Ecological and Evolutionary Constraints on Foraging. Chapman and Hall, New York, pp. 448–477.
- Janzen, D. H. and W. Hallwachs 1977. Janzen and Hallwachs Caterpillar Rearing Database. (<http://janzen.sas.upenn.edu/index.html>). Filemaker Pro 3.0 database accessible through Netscape and other web browsers.
- Kitching, I. J. 1984. An historical review of the higher classification of the Noctuidae (Lepidoptera). Bulletin of the British Museum (Natural History) Entomology series 49(3): 153–234.
- Kitching, I. J. and J. E. Rawlins. 1998. Noctuoidea. In Kristensen, N. P. ed., Handbuch der Zoologie. Band 4, Teilband 35, Lepidoptera vol. 1. Walter de Gruyter, Berlin.
- Nye, I. W. B. 1975. The Generic Names of the Moths of the World. Volume 1. Noctuoidea (part): Noctuidae, Agaristidae, and Nolidae, London. Unwin Brothers Ltd. 568 pp., 1 plate.
- Poole, R. W. 1989. Lepidopterorum Catalogus (New Series), Fascicle 118, Noctuidae. E. J. Brill and Flora and Fauna Publications: Leiden, 1313 pp.
- Poole, R. W. and P. Gentili, eds. 1996. Nomina Insecta Nearctica. A Check List of the Insects of North America. Volume 3: Diptera, Lepidoptera, Siphonaptera). Entomological Information Services, Rockville, Maryland, 1143 pp.
- Schaus, W. 1894. New species of Noctuidae from tropical America. Transactions of the American Entomological Society 21: 223–244
- Walker, F. 1856. List of the specimens of Lepidopterous insects in the collection of the British Museum. Volume 9. London. Edward Newman, pp. 1–252.